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STRUCTURE OF THE RECTUM

BY

CHAS. B. KELSEY, M.D.



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# STRICTURE OF THE RECTUM:

A STUDY OF

NINETY-SIX CASES.

BY

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## STRICTURE OF THE RECTUM.

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FOR convenience of study the following classification of the different varieties of stricture of the rectum has been arranged. It is intended to include all the possible forms of the disease.

	Congenital.	{ Complete. Partial.	
Acquired.	1. Spasm.		<i>a.</i> Dysenteric.
	2. Pressure from without.		<i>b.</i> Tubercular.
	3. Non-venereal.		<i>c.</i> Inflammatory.
			<i>d.</i> Traumatic.
			<i>a.</i> Ulceration (either chan- croidal, secondary, or ter- tiary).
	4. Venereal.		<i>b.</i> Due to unnatural vice.
			<i>c.</i> Neoplastic. (Gummata. Ano-rectal syphiloma.)
	5. Cancer.		

The first great division is into the congenital and acquired, and the congenital may be subdivided into the complete and partial with practical advantage, inasmuch as the former require immediate relief to prolong life, and the latter may exist for many years without causing fatal results or in some cases even being detected. A more exhaustive description of the several varieties of congenital malformations will be found in my general work on diseases of the rectum.

Of the acquired strictures the rarest is the spasmodic; but of its occasional existence, and almost invariably in association with some other disease, there can no longer be any doubt, though the fact has been questioned for many years. I have never seen it in an otherwise healthy rectum, but I have seen it present to a marked extent once in connection with a slight organic stricture and again with hæmorrhoidal ulceration.

In the latter case it was so marked as to render the introduction of the finger impossible till after the administration of ether, when it entirely disappeared.

Any form of pressure from outside the rectum may be sufficient to occlude it, but generally the pressure will be due either to a cancerous growth or pelvic cellulitis. In one of my cases the pressure of a cancerous mass springing from the promontory of the sacrum first manifested itself by causing complete and almost fatal occlusion. The patient was relieved by a colotomy done in the midst of acute peritonitis with the happiest result. In two other cases the pressure was due to the presence and contraction of old pelvic exudations. One of these was fatal from heart and kidney complications, after an attack of complete obstruction had been overcome by opium and frequent tapplings of the distended gut; the other was completely relieved by colotomy.

Non-venereal stricture may be either dysenteric, tubercular, inflammatory, or traumatic.

Dysenteric strictures are not very uncommon in New York, though generally seen in patients coming from warmer climates. As I have seen them they have been severe, the ulceration being extensive, and the cicatricial contraction considerable in amount.

Tubercular ulceration can only be diagnosticated from the general condition and history of the patient, and by examination for the bacilli under the microscope.

Inflammatory stricture, due to the destruction of a considerable amount of peri-rectal tissue by acute inflammation, is rare. That it may occur at any time as the result of a large abscess or extensive sloughing is undoubted.

Any severe form of proctitis resulting in ulceration may be a cause of stricture. Such a proctitis may result from the mechanical effects of a faecal impaction; from pressure arising from malposition of the uterus; from the erosion and ulceration of hæmorrhoidal tumors; in fact from any irritation sufficiently severe to set up an inflammation which ends in destruction of the mucous membrane.

Traumatic ulceration following operations or wounds of the rectum is not at all infrequent. Any one who has watched the slow cicatrization of a surgical wound of the rectum following an operation for hæmorrhoids or fistula, knows how



easily such a wound when neglected may change into an intractable ulcer and how surely the ulcer may develop into stricture.

The venereal strictures have always been a subject of discussion.

Without assuming too much as generally granted, it may safely be said that beyond dispute there are three forms of well-recognized venereal disease in the rectum which may result in stricture. These are: First, chancroidal, secondary, and tertiary ulcerations of the rectal mucus membrane. Second, ulcerations due to unnatural sexual intercourse, either simply traumatic or the result of direct inoculation. Third, an unusual form of tertiary disease of the general nature of a gummatous deposit variously described by different authors, and by Fournier in a Monograph, as "Ano-rectal syphiloma."

All of these much disputed conditions I think I can say I have myself seen, diagnosed, and treated.

Last of all we have the all too frequent manifestation of cancer in this part of the body—a disease which we are now beginning to treat with favorable results which a decade ago would have been thought impossible.

#### SYMPTOMS.

These may be grouped under two heads; those due to ulceration and those due to mechanical obstruction. In the great majority of cases the signs of mechanical obstruction will be preceded by those of the ulceration which has caused it. The symptoms of ulceration of the rectum are pain, and the discharge of bloody pus. The pain is located in the rectum; is of a dull, constant character; and unless the sphincter is involved is not greatly increased by the act of defecation. In addition to this there is generally pain in the back, scrotum, loins, and down the thighs. There is often great sympathetic vesical disturbance, and loss of sexual power. The discharge of blood and pus is quite characteristic. When the disease is of limited extent this occurs only with the stools, when more extensive it fills up the rectum and is passed independently of the feces. The rectum becomes filled with it during the night and the patient is awakened early in the morning by the desire for an evacuation which results only in the passage of slime and a little black blood.

After an hour or two there is another movement, this time often containing fæces mixed with blood and pus. This may be repeated several times at intervals of an hour or so, and then there may be several hours of rest. In an advanced case the patient is deprived entirely of rest by the persistent discharge; sleep is impossible, and life is passed in a constant effort to keep the rectum free from the irritating discharge.

The bleeding is not generally very profuse, and the patient seldom passes blood alone; the discharge generally consisting of pus and mucus streaked with blood, and occasionally of a little fæcal matter.

In addition to the discharge, the symptoms caused by the mechanical obstruction begin to show themselves after a time. At first there may be only great straining resulting in the passage of small lumps of matter. Later the patient will complain that he never has a passage without taking a cathartic, and that he has adopted the practice of doing this once or twice a week; unloading the bowel first of small pieces of solid matter, and then of a large quantity of semi-solid and liquid fæces. The condition of chronic obstruction with its attendant evils—dilatation of the bowel and intestinal catarrh above the obstruction, with ulceration and thinning of the intestinal wall—is thus insensibly established. One who sees many of these cases of chronic obstruction and knows how dilated and weakened the bowel may become above the stricture will be very cautious in the use of cathartics in this condition.

Acute obstruction may, at any time, be added to the chronic condition; but acute and complete obstruction are comparatively rare in stricture of the rectum; and acute obstruction as the first symptom of the disease without the previous history of ulceration is rarer still. In my own experience I have seen acute complete obstruction supervene upon the chronic condition in but three cases, two ending fatally in rupture of the colon, and the other relieved by opium and aspiration of the distended gut.

Acute obstruction as the first and only symptom of stricture I have seen but once—a case of cancer between the promontory of the sacrum and the rectum occluding the latter by direct pressure. In one other case acute obstruction ended fatally before there were sufficient symptoms of rectal disease

to enable us to make a diagnosis; the patient, a physician, complaining only of pain in the left iliac fossa, and of occasional passages of blood with the fæces. The autopsy revealed an annular cancerous stricture in the sigmoid flexure.

All of these cases illustrate the general rule that complete obstruction is only liable to occur when the stricture is high up, and that it may then occur very early and with very slight premonition. In many old cases near the anus it is surprising to see how many years life will be prolonged with the gut almost completely closed. The explanation is purely a mechanical one—with a stricture high up in the movable portion of the bowel, the force applied in the effort of defecation merely bends the gut upon itself and increases the obstruction by adding a flexure to the stricture. On the other hand, in disease low down, where the rectum is firmly held in place by bony points, all the force of the expulsive movement is brought to bear in a direct line with the orifice, and small, ribbon-like masses of solid fæces are driven through the opening as long as any opening remains. This is the explanation of tape-like stools as a symptom of stricture. They are only seen when the disease is near the anus, and they are often caused by a spasmodic action of the sphincter where there is no organic stricture.

Stricture of the rectum, whether cancerous or benign, left to its own course, ends fatally, either by obstruction or by exhausting the sufferer's powers. After a few years these patients sink into a miserable condition, worn out by constant rectal tenesmus, by chronic intestinal obstruction, and by degeneration of the kidneys. The only attempt at a cure nature is ever known to have made was in the case of Talma, where an intestinal anastomosis was established above and below the disease, and this was not successful in preserving life.

#### DIAGNOSIS.

The mere diagnosis of the presence of stricture is generally easy, because in the great majority of cases the disease is within reach of the finger by rectal examination, and, when felt, can be mistaken for nothing else.

When, however, a patient complains of the symptoms of ulceration and stricture, and no stricture is found by digital

examination, the problem at once becomes one of the most difficult in physical diagnosis. There is one part of the lower bowel—that part which can be reached neither by the finger in the rectum, nor the hand in the pelvis, nor by both combined—where our means of diagnosis are as yet very uncertain; and in just this part we occasionally, though rarely, find a stricture.

We have at present but one means of detecting stricture here, and that is the uncertain one of the rectal bougie, unless we open the abdomen and search. Let me exemplify this by one of my own cases. The patient in apparent perfect health was sent to me for diagnosis by Dr. Janeway. He complained only of a little blood in the passages, easily accounted for by hæmorrhoids; and of a pain deep down in the left side of the pelvis. The hæmorrhoids were removed; for a time the patient was better; then the symptoms were the same as before. Examination in the left inguinal region and pelvis showed only the sigmoid flexure, hard and round, rolling under the fingers. A full-sized rectal bougie, twelve inches long, passed without difficulty. Even with this evidence I could only say that the upper part of the rectum would admit a No. 8 rectal bougie. I could not say there was no disease, and I was cautious in my diagnosis, as Dr. Janeway had been before me; merely telling the patient there was but one way to settle the question and that was by an exploratory incision. This he declined, as I should have done, because the symptoms hardly seemed to justify it, and yet within a few weeks he died of acute obstruction from annular cancerous stricture of the sigmoid flexure.

In this matter bougies are only of limited utility. If I could pass no bougie at all after proper trials, and if, under ether, I still failed to effect the passage of an instrument I should not hesitate to make a positive diagnosis of a very tight stricture. Also, if a medium-sized bougie, say No. 7, passed easily, but a No. 8 could not be passed, and the symptoms pointed to old ulceration of the intestine, I should diagnose a contraction, but I should not do so till after several careful trials with the instruments.

It would seem as though the same facility in diagnosis in the upper rectum could be reached as in the deep urethra, but it has never yet been acquired. Attempts at the same kind

of exploration with bulbous bougies on pewter stems have been made, and several varieties of these are now in the market, but they have been unsatisfactory in my own hands. They are more difficult to pass than the flexible pure rubber bougie, and when passed they are not sufficiently delicate to detect strictures of large calibre.

In passing a rectal bougie the first obstruction is always



FIG. 1.—Soft-Rubber Rectal Bougie.

at the promontory of the sacrum, and the next is by the loose folds of mucous membrane. With a flexible rubber bougie the promontory can be passed without difficulty or force, and by the injection of water through the bougie the folds of mucous membrane can be drawn out of the way by dilating the canal, and the instrument passed full length. With the olive-



FIG. 2.—Metallic or Vulcanite Bougie.

pointed bougie on the metal stem, the promontory can only be passed by introducing the finger and lifting the end of the bougie over it, and beyond this all is uncertain.

I am now experimenting with a distinct olivary point and narrow neck on a soft rubber bougie with which I hope to accomplish something. In the ordinary bougie the olive point



FIG. 3.—Soft-Rubber Bulbous Bougie.

is too small to be of any use in diagnosis as is seen by Fig. 1. In the olive-pointed metal bougie shown in the cut (Fig. 2) the metallic stem is much inferior to the soft-rubber bougie, and any bending of it before introducing it only complicates matters and makes it more difficult to pass. It seems to me that an instrument can be made combining the advantages of both such, as is shown in Fig. 3.



Still one other method of diagnosis is open to us—the passage of the whole hand into the rectum. This is impossible for the average hand, and for any hand is more dangerous than an exploratory laparotomy. It requires an exceptionally small and narrow hand to practise this manœuvre with any degree of safety.

Should exploratory incision be decided upon, it should be made as for left inguinal colotomy, in order that an artificial anus may be established at the same time should a stricture be discovered.

On the whole, then, we can say that the mere diagnosis of the existence of stricture in the lower part of the rectum is easy, and beyond the reach of digital examination very difficult. After the presence of stricture has been decided upon, the determination of its character may also be a matter of great difficulty.

The first great point to be decided is between cancer and non-malignant disease.

There is an old and deeply rooted idea in the minds of the profession that a stricture of the rectum must be either cancerous or syphilitic—an idea founded on error and capable of doing much harm and injustice to people innocent of any sexual irregularities. Again and again I have been able to give great comfort to women suffering from this disease by disputing the correctness of this idea; and in my own practice the fact that a stricture is not cancerous adds little weight to the idea that it may be syphilitic.

In the collection of cases given at the end of this article it will be seen that of all non-malignant strictures only a small proportion were palpably venereal. Any of the gentlemen who have followed my clinic for any length of time will agree that the proportion of venereal strictures of the rectum is much smaller than they expected when beginning the study; and I use the word venereal intentionally to cover not only syphilis, but all possible diseases arising from the sexual act or its abuse.

Outside of cancer and venereal disease I have in the table enumerated the following varieties of stricture: Congenital; spasmodic; those due to pressure on the gut; dysenteric; tubercular; inflammatory; and traumatic. Each of these causes must be allowed its full weight in determining the nature of

any particular case, for none of them are so rare that they can be safely neglected.

To make the diagnosis as to the exact nature of a stricture may in some cases be impossible, but there are certain facts which will be found of great assistance.

As a first step in the differential diagnosis between malignant and non-malignant stricture the length of time the disease has existed is of great practical help. Cancer of the rectum generally runs its course in two or three years. When, therefore, a patient says stricture and ulceration have existed ten, fifteen, or twenty years a great point has been gained. When, on the other hand, a middle-aged patient says that the symptoms date back only a few months, and an examination reveals masses of hard tissue occluding the bowel, with more or less destructive ulceration, the disease can hardly be other than malignant. By careful attention to the history alone, the nature of the affection can thus very often be determined.

In other cases digital examination alone is sufficient for the differential diagnosis. Generally cancer in the rectum presents itself to the sight and touch as a mass of stony hardness, nodular, irregular, and without pedicle; growing in the substance of the rectal wall and involving all adjacent tissue; with no tendency to isolate itself and hang free in the cavity of the gut. More rarely it is seen in the form of a deep ulceration with hard floor and raised hard edges—an ulceration so pronounced and so destructive as to leave no room for doubt as to its nature. Again it not unfrequently presents itself as a bleeding, fungous mass involving the whole substance of the rectal wall, filling and occluding the gut, and perhaps extruding at each act of defecation.

In either of these three clinical forms the gross characteristics are diagnostic, and with experience it is not generally difficult to decide between malignant and non-malignant disease. The cases most doubtful are those where the rectum is occluded by dense masses of fibrous tissue—dysenteric, venereal, or resulting from simple ulceration. In these the amount of disease may be as great as or greater than in cancerous infiltration, and the hardness to the touch may be the same; but the history of the case and the length of time it has existed will generally solve the question.

Enlarged glands in the groin or hollow of the sacrum are of great value when found, and we always have the microscope to appeal to in case of doubt.

I would not, however, give the impression that this diagnosis between benign and malignant disease can always be made absolutely, either by the history or by digital examination, for such is not my experience, and I am occasionally very glad to secure a piece of the growth for microscopic examination before committing myself to a positive diagnosis. The following statement by Allingham has always represented to me a wonderful clinical experience. He says: "There is something peculiar about the feel of cancer, which the practised finger rarely mistakes even for simple indurated ulceration. I think it is many years now since I mistook the one for the other. There is also a peculiar odor which one cannot describe, but which once recognized will rarely be forgotten. In my opinion the odor is pathognomonic." This odor of cancer I have never been able to distinguish as anything diagnostic, and I confess to a feeling of relief when in Cripps's monograph on this subject I find that he also appreciates that in some cases the diagnosis may be difficult.

Greater difficulty may be found in the differential diagnosis of the different forms of non-malignant stricture from each other, than in deciding the first great question of cancer. Dysenteric contraction is known by the history and often by the extensive character of the fibrous induration. Tubercular disease may first be suspected from the patient's general condition, from the coexistence of lung trouble, or the family history; and the diagnosis may then be confirmed under the microscope. In congenital stricture in adult life the existence of a knife-edge constriction without ulceration or induration is diagnostic. Strictures resulting from slight traumatism, such as operations for hæmorrhoids, may be recognized by the absence of any other exciting cause, as syphilis, and by the history of long-continued ulceration.

The moment we attempt to say positively that any stricture is or is not of venereal origin we begin to trench upon the unknown.

In the collection of cases which forms the basis of this article some have been classified as syphilitic, and I have no doubt of the correctness of this diagnosis; but were I forced



to give the reasons for this belief I could only say that these patients had other well-marked signs of syphilis, and that the stricture was of a type which I have come to consider as indicating a syphilitic origin. The test of treatment does not apply in these cases, for neither mercury nor iodine has any effect. We know, however, beyond question, that chancre, late syphilitic ulcerations, and gummatous infiltrations do occur in the rectum, and do cause extensive strictures; and where no other cause can be found, and there is a reliable venereal history, we are justified in attributing certain strictures to these causes; but we are not justified in considering venereal disease as accounting for all cases of otherwise doubtful origin. In my table I have put down almost as many strictures as positively non-venereal as have been included among the venereal, and a number more as undetermined. In the former cases I was firmly convinced that the patient had never had venereal disease, and in the latter, a doubtful venereal history had no more weight with me in the diagnosis than any other of the possible causes.

Among the venereal strictures as distinguished from the syphilitic, cases will occasionally occur in which the possible causative influence of unnatural sexual vice must be considered. In my table there are two of these, one in a man, the other in a woman, both of whom acknowledged the practice. In both the vice was of long standing and in both there was ulceration and contraction; but whether simply traumatic or due to infection there was no way of deciding. In one the stricture was of considerable extent, and from its probably malignant nature I extirpated it with good result as to both subsequent stricture and incontinence. Examination of the specimen under the microscope, however, showed nothing but a very unusual amount of fibrous tissue.

#### TREATMENT.

The greatest advances in the surgery of the rectum have been made during the past decade in the treatment of stricture. Cases which a few years ago were allowed to die without surgical aid are now made perfectly comfortable; and operations which were then considered as hardly justifiable are now of daily occurrence and give the happiest results.

The means at our command for the treatment of this affection are: 1. Dilatation; 2. Incision; 3. Partial Destruction, including Electrolysis and *Raclage*; 4. Excision; 5. Colotomy; 6. General Treatment.

#### DILATATION.

This, either alone or in connection with incision, is one of the most reliable agents for the treatment of this disease. By dilatation I mean gradual stretching, not forcible divulsion. The latter is a justifiable procedure; one which under certain conditions may accomplish great good, but one seldom applicable.

Whether dilatation be practised as an independent method of treatment or as a supplement to division, it should always be practised in one way. Nothing is productive of more evil than forcing a bougie through a stricture when the instrument is too large to be passed without pain and violence, and no good is ever accomplished in this way. A bougie that is large enough to cause pain by stretching is always too large to do anything but harm.

The instrument best adapted for this purpose is the soft rubber one shown in Fig. 1. A size should be selected which will pass through the stricture without force and which may be left in place several hours without causing uneasiness. In this way absorption of the stricture tissue may be caused, and great benefit may result. It is a well-known fact that if the smallest filiform bougie be passed through a stricture of the urethra and allowed to remain for a day or two, a much larger size can then be substituted for it, and the same is true of the rectum. Any instrument the introduction of which causes pain will soon cause so much irritation as to render its use impossible; while with gentleness and time most non-malignant strictures may be greatly benefited.

My own rule is to select an instrument which can be left in place several hours, often all night, and to introduce it daily. When the disease is so high up that the long bougie is necessary, its introduction should never be left either to patient or nurse; for even with the soft rubber one mentioned great harm may be done. In cases where the disease is nearer the anus I have had these same instruments made five inches

long instead of twelve, and these may safely be entrusted to the patient. They are numbered in sizes from one to twelve (Fig. 4).

The treatment by gentle dilatation will accomplish most in cases of limited severity and as a supplement to the treatment by incision or excision. Some of the old fibrous strictures are too extensive to be relieved in this way, and in malignant



FIG. 4.—Short Bougie for Dilatation.

disease it can do little if any good—the disease steadily advancing. A patient with a malignant stricture which is threatening obstruction needs more radical treatment than the bougie, and, except in case of threatened obstruction, no possible good can be accomplished by it.

#### INCISION.

The treatment of stricture by linear proctotomy was introduced by the French surgeons, and judged by their first enthusiastic reports it seemed that by it alone a radical cure could be effected. Subsequent experience has convinced me that such is not the case, and that, like the analogous operation of external urethrotomy, it must be followed by dilatation to preserve the channel opened up by the knife. As a means of saving time, and of gaining a wider passage than can be hoped for from the bougie alone, it is of great value.

Two operations are spoken of—internal and external posterior linear proctotomy. The internal consists simply of a division of the stricture tissue alone by an incision in the median line behind; the cut being deep enough to completely divide all of the fibrous tissues. The external operation does this and more, inasmuch as it divides not only the stricture but also all of the tissue between it and the anus, with the sphincters.

The internal incision alone is a very dangerous one. It is often asked why, after dividing the constriction, go on and divide healthy tissue below it, including the sphincters? Simply for drainage. The most dangerous incisions in the surgery

of the rectum are those made into and through the wall of the bowel which are not continued to the surface—dangerous both from hemorrhage and sepsis. In the only case in which I ever performed this partial incision it was followed by a dangerous pelvic inflammation.

The external operation, on the other hand, provides for the control of hemorrhage and for drainage in the most perfect way, and is therefore much safer though more extensive.

The originators of this operation employed either the Paquelin cautery knife or the chain *écraseur* for the incision, both of them being bloodless; and in my own first cases I used the cautery. But the bleeding with the external operation is not a matter to be feared, being easily controlled by packing the incision with charpie, and I now use a straight, blunt-pointed bistoury passed into the bowel and through the stricture on the left index finger as a guide. Care should be taken to have the incision reach well above and well through all the stricture tissue, and to be as nearly as possible in the median line behind.

The danger of subsequent incontinence from this incision, if the sphincters are in good condition when it is made, is not very great; but the wound at the anus generally takes many weeks to heal and this is a great objection to it. There are two ways of avoiding this. One suggested and practised with good result by Weir is to confine the incision to the stricture, leaving the anus intact; and to drain this incision by a tube brought out through the skin at the tip of the coccyx. This I have tried in several cases with the result of saving much time. The tube should be left in till all danger of periproctitis has passed. If there be no rise of temperature by the fourth day it may be safely removed, and the wound caused by it will generally heal promptly.

Another method I have sometimes used is to divide the sphincters and then employ three or four deep provisional wire sutures between the anus and the stricture, leaving them loose and stuffing the incision with charpie. When all danger is passed and granulation is well under way the opposing surfaces are scraped and the sutures tightened. This may be done at about the end of the first week, and as more or less firm union is pretty sure to result considerable time is saved.

The one great danger of this operation is septic periprocti-

tis, and with proper precautions as to antisepsis and drainage this may generally be avoided. The danger of primary hemorrhage is not great. No large vessels are cut and all bleeding is within easy reach. It can seldom be necessary to tie any vessel as the wound can so readily be tightly packed with charpie. Secondary hemorrhage I have seen once in a case of very extensive cancer divided with the cautery.

The after-treatment consists only in the use of the bougie, commenced as soon as the incision has begun to fairly close up, that is to say, after three or four weeks, and followed steadily and gently as already indicated. The bougie should be used for three or four hours each day, or, as is my favorite practice, introduced when the patient goes to bed and left in all night.

In the great majority of cases the short instrument will reach above the disease, and after one or two trials its use may be left to the patient. If pain is complained of it is a sure indication that the instrument is too large and is doing harm.

My own experience with this method is given at the end of this article. Only three of the cases were malignant, and these three have given me no encouragement to continue its use—in fact my old antipathy to colotomy is the only reason for ever having employed it in malignant stricture. The first case of malignant disease was the one in which severe and almost fatal secondary hemorrhage occurred on the separation of the sloughs made by the cautery. The patient was a middle-aged woman with extensive cancerous deposit and yet in good condition. The disease seemed low down and the rectum was nearly occluded. After cutting through the first stricture, a large ulcerated cavity was opened up, and above this was a second stricture, also so tight that the opening could hardly be discovered. This I also divided with great difficulty and constant fear of the peritoneum. The operation was attended by a good deal of shock and the patient lived only a few months. From her good general condition I am satisfied she might have lived two or three years with a colotomy.

The second case of cancer was in a young man also with extensive disease. He died on the tenth day, apparently from exhaustion, mixed with some anomalous symptoms of septic peritonitis.



The third case—in a young woman—was fatal in eight hours. The disease was not as extensive as in either of the other two, but the patient was exhausted by chronic intestinal obstruction, and sank quickly from the shock of the operation. She might have done the same from a colotomy, but both of the others would probably have done much better after colotomy than proctotomy.

Neither theoretically nor from my own experience can I recommend this operation in malignant disease. The danger of it is certainly as great as that of a colotomy, and nothing more than temporary slight benefit can be hoped for, as in the nature of the case subsequent dilatation can do little good.

While proctotomy has been thus unsatisfactory in malignant disease, exactly the opposite has been the case in all of the benign strictures, and here I have never had occasion to regret its performance. For all cases of non-malignant stricture which are not so far beyond the reach of local treatment that colotomy is indicated from the first, the choice must lie between this plan of treatment and complete excision. I have within a few weeks performed colotomy on a patient for whom I did proctotomy nine years ago, and who for five years after the operation was in a greatly improved condition, though at that time most men, I think, would have considered her beyond hope of relief from anything except a colotomy, so grievous was her condition: she, however, gained health and strength and was able to keep the stricture well under control till about two years ago, when a large pelvic abscess formed on the left side, nearly occluding the gut above the original stricture, and discharging large quantities of pus into the rectum. For this second condition, together with the old stricture, I did the colotomy, as the combination was rapidly exhausting her.

Although there had been some recontraction, there had been no increase in the amount of fibrous tissue, and no return of the ulceration which had been cured by the operation of nine years before.

Other cases I have now under observation in which the patients have been so greatly improved that they consider themselves almost entirely cured, and can only be induced to use the bougie at long intervals—cases in which all straining, tenesmus, and purulent discharge have ceased, and in which the patients have one natural painless passage daily. As

long as these patients can be made to care for themselves and to continue the use of the bougie with regularity they are perfectly comfortable, but the neglect of the bougie has in my experience invariably been followed by recontraction.

In a general way it may be said of this plan of treatment that in selected cases of non-malignant disease—those in which the ulceration and contraction are of limited area and do not involve too great an extent of the gut in length, though perhaps almost completely occluding it—it is to be preferred over all others. In them it is a satisfactory substitute for colotomy or exsection, and in some it will effect as near a cure as is ever gained in this disease.

#### PARTIAL DESTRUCTION. ELECTROLYSIS. RACLAGE.

The consideration of these things need detain us but a moment. In benign strictures all that they can accomplish can be done better by linear proctotomy, and in malignant disease they are contra-indicated. The cauterization or scraping of old non-malignant ulcers of the rectum has its undisputed value; but nothing more unsurgical can well be imagined than the application of nitric acid to a cancerous rectum, or the attempt at partial destruction and removal by any other means. In the days when extirpation was considered unjustifiable, and colotomy as worse than death, these things had their place, but they are now simply examples of timid and meddlesome surgery.

With regard to electrolysis we occasionally see a case of “perfect cure” reported by this means in some journal, but never one in which the certainty of that result is verified beyond suspicion. Electrolysis reduced to fact means in the treatment of stricture of the rectum either simple dilatation or the application of the cautery. The olive-pointed electrodes placed against a stricture and gently pressed inward for ten or fifteen minutes will cause exactly the same amount of dilatation and absorption whether the elaborate battery be connected with them or not; and when we come to cauterization the battery will accomplish no more and no less than any other destructive agent. This at least is the result of a careful series of experiments with this means of treatment in my own practice—experiments which, after two years’ trial, had ac-

accomplished nothing not attainable by much simpler means. I do not mean to say that with a current of sufficient strength a passage cannot be made through a cancerous stricture, because this is exactly what can be done, but a mild current has no effect and a strong one simply cauterizes.

### EXCISION.

With regard to excision there are two questions to be considered: First, the class of cases to which it is best adapted; and, second, the best method of its performance.

Extirpation of the rectum has until recently been considered as indicated only in malignant disease, but of the propriety of thus limiting the scope of the operation I am beginning to have serious doubts—doubts which will be settled not alone by the supposed dangers of the operation, but also by the comparative comfort of the patients with extensive benign strictures after extirpation and after the other methods of treatment at our disposal. The danger of extirpation in selected cases is not, to my mind, so much greater than that of proctotomy that I should hesitate on this account alone to do the former instead of the latter, were I satisfied that by it the patient could be rendered more comfortable, both as regards faecal incontinence and subsequent stricture due to the operation.

My personal experience with extirpation of benign stricture is limited, as will be seen by the table, but all of the cases have resulted favorably as regards sphincteric power and the absence of recontraction; and though these are manifestly not sufficient to generalize upon, they are enough to make me anxious to try the treatment further in selected cases. As it appears to me now, it is a possible substitute for proctotomy and dilatation in the class of cases to which these are best applicable, rather than for colotomy. Were the disease sufficiently extensive to make colotomy seem necessary, it would probably be too great for extirpation, as is the case with malignant stricture. But where the induration is great, the stricture close, and yet so much of the gut is not involved in length that a complete circular resection with preservation of the sphincters cannot be done, I am not sure that experience will not soon teach that it is better to relieve the patient of



his disease at one stroke than to trust to making him comfortable by proctotomy and subsequent dilatation. It is the choice between cure and palliation, and it must be decided by the condition in which the rectum can be left as regards stricture and incontinence after extirpation.

Extirpation for cancerous disease will hardly again in the future be abandoned, as it was in the past, as unjustifiable. All that now remains for it is to decide the proper limits of its applicability and if possible improve upon its technique. Even were it to be decided that in a majority of cases an early colotomy gave longer life than extirpation, we should probably all go on doing the latter operation; for a possible cure would more than counterbalance any additional safety of colotomy with its certain death after a time but short at the best.

The limits of extirpation in cancer have not yet been determined. On the one hand are the German surgeons tending to the most radical operations and removing the entire rectum up to the sigmoid flexure with at least temporary success. Opposed to these are the English specialists advocating more conservative practice, and tending to restrict the operation to disease of comparatively limited extent; while in America we are trying both plans, doing at times fully as radical operations as the Germans, and waiting for the results of clinical experience.

Since Kraske has shown us a new way of attacking the rectum, the mere question of the length of gut to be removed has lost some of its importance; and the question is now not whether the disease reaches above a point which can easily be attained by dividing the anus and rectum down to the tip of the coccyx; but whether, when the disease is much more extensive than this, its removal, which is surgically possible, is attended by good results in prolonging life. No surgeon would to-day hesitate to remove eight inches of rectum instead of three were he convinced that in such extensive disease all involved lymphatics could also be removed, and that the chance of immediate recurrence was no greater in the major than in the minor operation.

One rule may be considered as established—the disease should not be attacked with the knife unless there is reasonable certainty that it can all be removed, and that the lymphatics have not to any extent become involved. A chain

of lymphatics in the hollow of the sacrum may sometimes be extirpated if they are involved at the time of the operation, but the chance of removing them all under such circumstances is not good, and a speedy return may be anticipated. A point has also recently been made by Cripps that the operation is of doubtful propriety when the disease involves the upper part of the recto-vaginal septum where it is covered by peritoneum; for the reason that the latter, if involved, will speedily cause a recurrence. If this point be well taken, it will greatly limit the field of the operation, and reduce it to what was its limit before Kraske's method was discovered, that is, to disease low down in the rectum and freely movable on the adjacent structures. The fear of wounding the peritoneum itself has long since passed away, the mere opening of that cavity having little effect upon the mortality of the operation.

In deciding the question as to the immediate mortality of exsection, a large number of cases by an individual operator is much more valuable than an equal number of scattered cases by various surgeons; for the success or fatality of this operation may easily depend upon individual skill. Other things being equal, the man who has operated most frequently will get the best results.

Before undertaking an extirpation, the patient should be carefully prepared for operation. Rest in bed for a few days to accustom him to the enforced quiet to follow is an excellent idea. The bowels should be thoroughly unloaded, beginning with something to act upon the liver at least three days before the operation, and following this with small doses of salines on the succeeding days. Two hours before operation a final enema of water should be administered and the ano-perineal region, buttocks, and sacral region thoroughly disinfected, first by shaving and then by washing with bichloride 1 to 2,000.

Although this usual and advantageous preparation of the patient is always best when possible, in some cases of tight stricture and fecal impaction a course of purgation may end fatally from a weakened and ulcerated bowel, or may fail entirely to bring away anything but fluid. Where the passage is comparatively free, my own rule is to clear out the bowels, but in cases of tight stricture with chronic obstruction the danger of this course is greater than that of operation in the patient's usual condition.

Either ether or chloroform may be used as an anæsthetic, depending upon the condition of the patient or the preferences of the operator; and the patient should be held in the lithotomy position by Clover's clutch, provided the incision is to be in the perinæum (Fig. 5).

The technique of the operation will vary with the amount of disease to be removed. Let us take first a case of stricture beginning an inch or so above the sphincters and extending say three or four inches up the bowel, in which it is necessary to remove a complete cylinder of the rectum. One great ob-

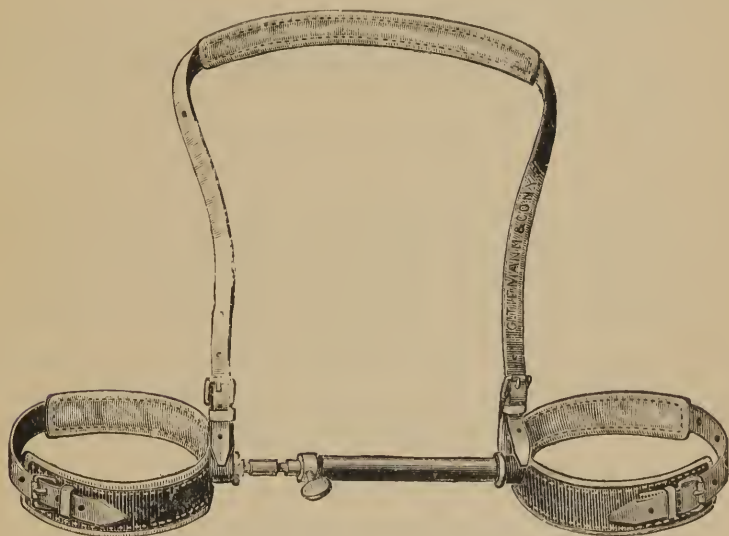


FIG. 5.—Clover's Crutch (Peter's Modification).

ject will be to preserve the anus and sphincters intact, and this may easily be done by the following method.

A blunt-pointed straight bistoury is passed into the rectum and the anus is divided in the median line behind as far up as is possible without encroaching upon the disease. For safety half an inch of healthy mucous membrane should be removed with the affected part both above and below the edge of the cancer, and the rectum by this first dorsal incision through the sphincters should be divided up to that limit.

The blunt-pointed bistoury is of no further use and a long, strong, sharp-pointed scalpel is substituted. This is entered

in the wound already made and passed along behind the rectum till its point has passed the upper limit of the growth as indicated by the finger of the left hand in the gut. All of the tissue behind the gut with the skin is then divided in the median line by a single sweep of the knife. The second incision simply deepens the first and carries it to a point above the disease; though the first divided bowel and the second

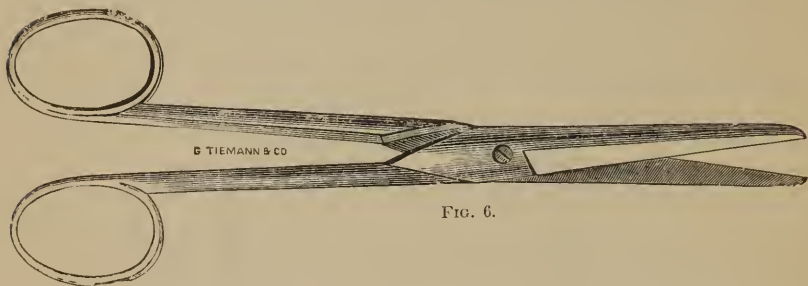


FIG. 6.

does not touch bowel but divides the tissue behind it. The object is to dissect out as rapidly as possible the diseased portion of gut as a cylinder and without dividing it.

The second knife is now abandoned and the operation is completed with the scissors shown in the cut, Fig. 6, the dorsal incision being tightly packed with large firm sponges and the edges of the wound held open by the retractors shown, Fig. 7.

With the left index finger in the diseased cylinder for a guide, the right side of the affected gut is freed from its at-



FIG. 7.—Retractor.

tachments in the ischio-rectal fossa by a few bold cuts with the scissors till the attachment of the levator ani on that side is reached and cut through, and the same thing is done on the left side as rapidly as possible. If the operator be ambidextrous the hands may be changed, otherwise the cutting on the left side may easily be accomplished by crossing hands. The skill and boldness of the operator is shown at this part of the

operation better than at any other. The inexperienced tries to make a careful dissection and stops for hemorrhage, while he who has operated before, completes this stage of the work with a few bold strokes and leaves the bleeding to his assistant with his sponges and pressure.

The next stage in the operation is the separation of the rectum from its attachments in front to the prostate in the male and the vagina in the female. In the male a sound in the bladder is of great assistance, and the separation in either sex can best be accomplished with the handle of a scalpel or the closed blades of the scissors, unless the disease has invaded adjacent parts, when slower work with the knife may be necessary.

In this operation two or three pairs of long forceps such as are shown in Fig. 8 will be found of great assistance. In one of my own cases the stricture was so tight that the index



FIG. 8.—Long Forceps for Incision.

finger could not be passed through it as a guide, and the whole mass was seized with such a pair of forceps while the dissection was carried out around it.

When the separation has been properly completed on all sides, the diseased cylinder will be found to be perfectly free and can be pulled down and cut off above the disease with ease. If it does not come down to the surface easily, the point of attachment will usually be found at the insertion of some fibres of the levator. The healthy rectum is then seized with a pair of long forceps to prevent its retraction, and the gut is cut across with the scissors about half an inch above the disease; the wound is tightly packed with sponges and the specimen examined carefully to see that the operation has been complete and that no cancerous tissue has been left.

Up to this point no bleeding vessels have been tied. Excepting the first dorsal incision it is useless to tie them till the operation is completed, as they all come from above and the same vessel may be cut across and require the ligature several



times. It is much better to trust to sponges to control the bleeding till the extirpation is completed, when it will be found that only a few ounces of blood have been lost and not more than half a dozen ligatures are required. I have completed the operation with only two ligatures.

The operation from the time of the first incision to the section of the bowel above the disease and the securing of all bleeding points should not consume in a simple case more than ten minutes, and in a difficult one five more may be allowed for separating the gut from its anterior attachments. It will be seen at once that this is a very different matter from the old and tedious dissection from below upward, made with successive strokes of the knife and requiring hours for the application of ligatures, each vessel being cut and tied again and again as the dissection was carried upward into the pelvis.

The subsequent treatment of the wound thus made is a matter of individual preference.

The German surgeons generally try to get primary union by drawing the end of the rectum down to the skin, attaching it by a row of sutures; closing as much as possible of the dorsal incision and introducing drainage tubes.

The English operators (Cripps, Allingham) prefer the greater safety of an open wound, stitch the gut lightly to the skin, introduce drainage tubes, and leave the wound to close by granulation.

In my own earlier cases I leaned to the latter method, but having had no bad results from this cause I have in each successive case tried a little more definitely for as much primary union as possible. Much time is saved if any considerable part of the incision can be closed by first intention, and there is less cicatricial stricture to be dilated subsequently. For this reason I now draw the end of the gut well down, fasten it accurately to the sphincters in front and at the sides, pass a drainage tube into the dorsal incision on each side of the gut at the level of the tip of the coccyx, and introduce deep silver sutures to close the dorsal incision but leave them loose. The dorsal incision is then packed with iodoform gauze. After a week, if all has gone well, the tubes may be removed, the granulating surfaces of the dorsal incision scraped, and the silver sutures drawn tight. In this way I have saved much time without increasing the danger of proctitis.

It is needless to say that at every step in this operation the most complete antisepsis should be observed; for these cases die, when they do die, of septic periproctitis oftener than from all other causes combined. After the operation a large and perfect absorbent antiseptic dressing should be employed, and opium should be given freely with absolute milk diet to confine the bowels for at least a week. Should the bowels move involuntarily, so as to make the removal of the first dressing necessary, or should there be any rise of temperature, the wound may subsequently be treated as an open one and reliance be placed upon thorough irrigation. Should there

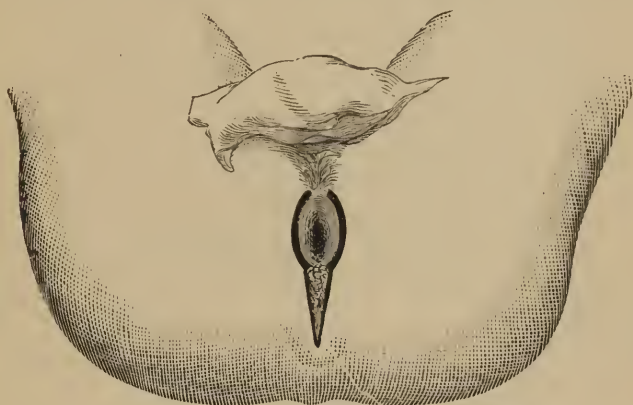


FIG. 9 (Allingham).

be chill and an alarming rise of temperature, all sutures should be cut, the parts opened widely up, and irrigation with weak bichloride or salicylic acid solutions used to reduce the temperature; but this accident has never happened to me.

The operation thus described may be modified in many ways according to the nature of the case.

The disease may involve the sphincters, in which case the deep dorsal incision should be made by entering the bistoury behind the anus through the skin between it and the coccyx. Two semicircular incisions should then be made through the skin which together surround the anus, meeting in the perineum in front and in the dorsal cut behind (Figs. 9 and 10). The diseased gut and sphincters should then be dissected out as a cylinder as in the former case. The operation is no more

serious than the other, but there will of course be no sphincteric power after the patient recovers, though there may not be any trouble from incontinence.

The disease in other cases may consist in a circumscribed nodule in some part of the rectal pouch which must be removed without any attempt to remove the gut as a cylinder. This operation is apt to be more difficult and bloody than the method already described. The dorsal incision which is the key to all these operations should be made as in the first case. The mass must then be attacked boldly and extirpated as quickly as possible. There will be no time for careful dissection in such cases. It is better to remove too much than

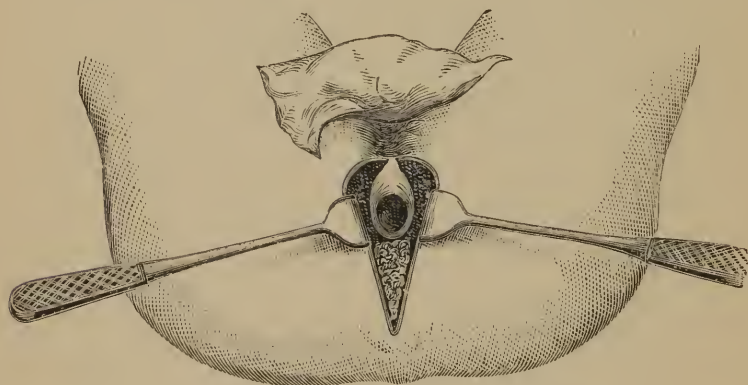


FIG. 10 (Allingham).

too little, and bleeding must be disregarded till the diseased mass is removed by a few bold strokes with knife or scissors.

In my first operation of this sort—a case of ulcerated epithelioma at the level of the prostate on the anterior wall of the gut—I encountered a bleeding which was very startling. All went well till after the dorsal incision was made, and I attempted to circumscribe the disease with a sort of limiting useless incision not much deeper than the mucous membrane, which was intended as a guide for the amount of tissue subsequently to be removed by a careful dissection. Before this plan of future work could even be mapped out, the bleeding was so profuse as to render its instant control absolutely necessary; and never before or since have I abandoned an attempt at graceful surgery and simply extirpated a mass of



cancerous tissue with the same celerity. The moment the disease was out the bleeding was completely under the control of pressure by a few sponges. I mention the case simply to illustrate as forcibly as possible that the secret of success in extirpation of the rectum is to remove the diseased mass as speedily as is possible, and to control the bleeding by pressure during the operation and afterward till ligatures can be applied. In all my experience in operations of every sort upon the rectum I have never seen a case of hemorrhage which could not be effectually controlled by direct pressure properly applied.

There is one after-consequence of these operations which must be carefully guarded against in the treatment, and that is cicatricial contraction. Of course the substitution of a cicatricial contraction for a malignant occlusion is a great gain; but even the cicatricial contraction may be in great measure avoided by proper care. As soon as such contraction begins to manifest itself, say in three or four weeks after the operation, the patient must be instructed to use the short bougie already described in speaking of dilatation. One of ample size (Nos. 8 or 9) should be chosen and introduced daily, being left in for several hours. I much prefer having the patient introduce them on going to bed and leaving them in all night. Generally they will cause no inconvenience, and the patient will not be conscious of their presence. By this means contraction may either be entirely prevented, or may be so limited as to do no harm.

#### KRASKE'S OPERATION.

The various operations which are included under this general head are all designed to effect an entrance into the cavity of the pelvis by an incision at the left side of the sacrum. By such an incision the entire rectum may be removed without interference with the sphincters, and many of the more difficult operations upon the female genital organs may be performed in addition. The operation upon the rectum may be either of the nature of an amputation or a resection.

There have been several modifications of Kraske's original method, but all of them may be reduced to two general plans. The first is merely an enlargement of the incision already de-

scribed for exsection, upward through the left sacro-sciatic ligament, combined with amputation of the coccyx and the removal of the end and left border of the sacrum. The other consists in approaching the disease from behind instead of below. The incision in this case is made from the middle of the sacrum to the tip of the coccyx reaching down to bone. The soft parts on the left side of the incision are then detached, the left sacral and coccygeal ligaments are divided as high up as the third sacral foramen, and the coccyx is removed. If still more room be necessary, the sacrum may be chiselled away on a line from the third foramen down to the tip, and the lower sacral vertebræ may be removed. The first incision is best adapted to cases involving the anus where the whole rectum has to be amputated; the second to actual resections of a part of the rectum with union of the divided ends. In this operation the peritoneum is of necessity opened, and it may be left so after the upper end of the gut has been drawn down, a drainage tube being inserted into the peritoneal cavity and the wound packed with iodoform gauze; or the cut edge of the peritoneum may be stitched to the serous surface of the sigmoid flexure as Schede has proposed. The divided ends of the gut are united more or less closely by sutures, and where the whole of the anus has been removed the end of the gut has in some cases been brought to the surface at the upper limit of the wound, and an artificial anus established in the sacral region.

This is not a place to go into an elaborate study of the statistics of this operation, nor, as yet, are these statistics of great value. Suffice it to say that they are steadily improving, but are still much worse than those of the operation previously described, as would naturally be expected. What has been thoroughly established is that the entire rectum and anus may be removed by a rapid operator by this method in about twenty minutes, and that a fair proportion of the cases recover with more or less permanent disability in the way of cicatricial contraction, incontinence, and faecal fistula in the sacral region. The operation has certainly earned for itself a permanent place in the surgery of the rectum; and the length of life after it when patients recover seems fully as great as after the lighter operation. In none of my own cases has it seemed applicable for the reason that in all in which such an

incision would have been necessary to remove the disease, the adjacent structures have been so much involved that I preferred colotomy.

Extirpation of eight inches of the rectum where the disease involves only the rectum may be proper; but extirpation of rectum, prostate, and cancerous peritoneum is a different matter, and is an operation which I have never yet been ready to attempt. I have, however, practised the dorsal incision in several cases for the sake of better attacking deep recto-vaginal and other fistulae and have been surprised at the ease with which the disease could be approached.

#### COLOTOMY

It will be seen at once from what has preceded that the field of this operation has been greatly encroached upon by the operation of excision; and yet, in other directions, it has been increased. It is easy to state in a general way the class of cases to which colotomy is best adapted. They are: First, the old and incurable cases of non-malignant ulceration, stricture, and fistulae which are threatening life either by exhaustion or obstruction. Second, the cases of obstruction from pressure outside of the bowel, as in cancer of the pelvis, or old pelvic inflammation, and cases of intestino-vesical fistula. Third, the cases of cancer of the rectum in which excision is for any reason contra-indicated.

My own series of inguinal colotomies illustrate nearly all of the different classes of cases calling for the operation, including as they do cases of cancer with vesico-intestinal fistula; extensive non-malignant ulceration and stricture; acute obstruction by pressure; and the ordinary cases of malignant stricture. Nearly all have been satisfactory in prolonging life and relieving pain. In one I operated upon a gentleman whose rectum and pelvis were filled up with cancer, on his eightieth birthday. He had been told a year before that a colotomy would "eventually" be necessary, and when I was called upon to do the operation he was very near the end. After consultation I expressed my willingness to operate should the patient and family physician wish it, but declined to go further than this. I did operate, the patient did well till the bowel was finally opened on the third day and two

large faecal passages had occurred, and then he sank quickly and died. I have never attributed this death to the operation. All that can be said of the operation is that it failed to prolong life. The patient was liable to die at any moment, in fact very nearly died upon the table. The operation was done with the least possible shock and was entirely completed in seventeen minutes from the time of the incision, and yet in spite of it he died. The attempt to prolong life was a desperate one and it failed, but there was no proof that it shortened it by a single hour.

Another of my cases was unsuccessful, but from no fault of the operation. The patient was over sixty, and much exhausted with the cancerous disease. When the abdomen was opened it was found partially filled with serum; the intestine was greatly congested, and the entire mesentery was infiltrated with cancer. There were no distended coils of gut, both large and small bowel being empty and contracted. It was with great difficulty that a piece of the sigmoid flexure could be stitched into the abdominal incision so closely was it bound down by cancerous infiltration of the mesentery, and a loop of small intestine which also appeared in the wound was only a trifle more movable. The large intestine was chosen and with difficulty sutured, the muscular layer being very friable. The patient did well for forty hours, when severe vomiting began and the temperature steadily rose to  $105^{\circ}$  with signs of collapse. The wound was examined and found in good shape; the bowel was incised but there was no escape of gas as is usual, and only a small quantity of faeces was found by introducing the finger into the proximal end. Death followed in a few hours with all the symptoms of collapse, and on opening the abdomen a complete obstruction with a gangrenous loop was found in the large intestine at the splenic flexure. The obstruction was due to a band of cancerous mesentery which had caused a sharp flexure in the gut, which flexure was completely obstructed by a small scybalous mass. Although the obstruction had been fatal in less than twelve hours, there was no great distention of the large intestine above the obstructed point; and though I had opened the gut as soon as the vomiting began, under the impression that the symptoms might be due to the complete obstruction caused by the operation, the failure to find any obstruction at the

wound, joined to the fact of a temperature of  $105^{\circ}$ , led me to suppose the patient dying of septic peritonitis.

A second opening of the abdomen might have saved the patient's life for a few weeks, but the sudden and complete collapse, and the already known condition of the abdominal contents, seemed to contra-indicate further surgery.

Such cases as these in no way militate against the general good results of the operation we are considering.

Regarding colotomy there are a few general considerations to which it may be well to call attention.

It is not a dangerous operation when done under anything like favorable circumstances, that is, before the sufferer is in the last stage of the disease and exhausted by intestinal obstruction or by suffering. Cripps very justly calls attention to the worthlessness of statistics on this point as made from a large number of separate cases by individual operators; for the mortality of the operation, as with extirpation, must always bear a very close relation to the skill and experience of the operator, and unsuccessful cases do not find their way into print. For himself he reports forty-one cases with one death.

As to the benefits arising from the operation, too much can scarcely be said. That it prolongs life by the relief of pain, the prevention of obstruction, and retarding the growth of cancerous disease, is beyond question. That it substitutes in many cases a painless death for one of great agony is also indisputable. My own objections to the operation were at one time deeply rooted, but they have been entirely removed by seeing one or two cases in which stricture had been left to its own course and termination in complete obstruction and rupture of the gut; and by seeing the amount of relief which has followed an artificial anus. The idea that it is as well to let a patient die as to subject him to a colotomy has no supporters among surgeons who have had any experience with these cases. Indeed I think that the practitioner who to-day sat by and allowed a patient to die of obstruction because of any sentiment against this procedure would hardly be held blameless. I can only say that, after trying every other means of treatment and being obliged to admit the fruitlessness of them all, I have come with most others to admit the great benefits of colotomy, and have never performed it in any case



in which either the patient or myself has afterward regretted it. This is exceedingly well exemplified in one of my patients upon whom I did the operation for non-malignant disease. The rectum has so far healed that I have offered to close the artificial anus; but she will not consent. The memory of her old sufferings is too vivid and her present comfort too great.

There can be no argument in favor of colotomy so strong as a single experience with a case of cancer of the rectum left to its own course and termination in fatal obstruction; and I think that no matter how strong one's prejudice against an artificial anus may be, a single case of this kind will convert him. There is no more painful death, and no class of cases in which the surgeon appears at a more hopeless disadvantage. I have successfully combated several cases of serious obstruction by medical treatment, and even in almost complete obstruction of the rectum by stricture I have prolonged life till the patient died of other causes; but I know now that an early colotomy would have been much better surgery; and I shall never cease to regret one case in particular in which I attended a patient with cancer of the prostate from its first discovery to its end in rupture of the caput coli. At the autopsy there were secondary deposits in the liver and mesenteric glands, and the abdomen was partially filled with fluid, so that it was evident that even colotomy could not long have prolonged life; but it would at least have given a less painful death.

Colotomy should not, however, be looked upon merely as a means of preventing obstruction or of overcoming it when actually present. The operation fulfils other indications, and though not a dangerous one when done early, the mortality is greatly increased by waiting till obstruction has set in. Again delay may cost a patient his life, as I have reason to know in my own practice. The patient was a young physician with non-malignant stricture and ulceration. I examined him under ether, hoping to reach the stricture and divide it, but found that the disease extended too high up for such treatment. Colotomy was recommended and assented to, but as the man was no worse than he had been for many months, there seemed no great hurry, and the operation was delayed. For a long time he had been able to have a passage only by the aid of strong cathartics; and it was his custom to take these on Saturday night and devote Sunday to unloading the

bowel. As he was a physician and an intelligent observer of his own case, I saw no harm in allowing him to continue the practice a few weeks longer, but the result was disastrous. He took his medicine once too often, the distended gut gave way, and he died of faecal extravasation.

The hour when a chronic obstruction will change into a fatal condition can never be foretold; and after acute obstruction has occurred the dangers of a colotomy are greatly increased.

If colotomy is to be done it should be done early in order that the patient may be spared as much pain and the growth of the disease be delayed as long as possible. It should be recommended in all cases of non-malignant stricture and extensive ulceration which have advanced beyond the point where proctotomy and dilatation can give relief. In malignant disease the choice between colotomy and excision may be more difficult to make. All cases manifestly beyond the reach of excision should be operated upon by colotomy at once; but each surgeon must be the judge of what cases come under this category and of how much danger is to be incurred for the hope of cure which excision offers.

The range of applicability of colotomy to the treatment of non-malignant affections has been greatly increased by the fact that the opening can be so made as to admit of its easy subsequent closure should it be advisable. This is a fact which often gives great comfort to the patients and induces them to consent to what might otherwise be refused.

Regarding the choice of operation between the inguinal and lumbar region, I can hardly imagine any case in which the old lumbar operation is preferable to the inguinal. The question has been much discussed, and recently Bryant with his one hundred and four cases has said all that can be said in favor of the lumbar incision. I can see no reason from his arguments why the present decided preference for the front operation is not well-founded, except possibly his statement that controlling pressure by a pad can be more firmly applied in the other incision, and I have found no difficulty in securing this pressure after the inguinal operation. As regards ease and certainty of performance, the subsequent cleanliness of the patient, and the ability to care for the opening, all the advantages are in favor of the inguinal opening. The dangers

of the two operations are about the same, as in the majority of cases the peritoneum is opened in both alike.

In performing the left inguinal operation no particular previous preparation of the patient is necessary. Many of them are not in condition to have the bowel thoroughly emptied by a cathartic; nor is there anything to be gained by doing so. The operation often has to be done on very short notice, and sometimes in the midst of complete intestinal obstruction.

The abdomen should be shaved and thoroughly cleansed on the day before the operation, if possible; and should be again washed with bichloride solution and ether at the time of the operation. It should then be covered with towels wrung out in warm carbolic solution at all parts except where the incision is to be made. It is needless to say that the comparative immunity with which the abdomen may be opened to-day is almost entirely due to antisepsis, which here should be of the most perfect kind.

The incision which I practise is the one used by Cripps and shown in the cut, except that I do not find it necessary to make my incision quite as long as he has figured (Fig. 11). An imaginary line is drawn from the anterior superior spine to the umbilicus. The incision should cross this at nearly right angles and should be an inch and a half distant from the anterior spine. The incision should be two inches in length, and it may be made an inch or two higher or lower as the operator prefers. If there be any reason to suppose that the disease involves the sigmoid flexure, it is well to make the incision higher up; and in this way, and by pulling down the upper end of the gut, the opening in the latter may be brought very near to where it would be in the lumbar operation.

The incision is carried down on a director as in all laparotomies till the peritoneum is reached, and before this is opened the cut surface must be thoroughly dry so that no blood will enter the abdominal cavity. As a rule no vessels will need tying, and after a few minutes' pressure with a towel the peritoneum may be opened on a director to the length of the cutaneous incision.

Usually a coil of gut presents at once in the wound, and this must be carefully examined to decide whether it is the part wanted. In the majority of cases it will be large intes-



tine and may be fastened at once into the wound, but this must not be taken for granted without examining for the longitudinal bands of muscular tissue or the *appendices epiploicæ* which are characteristic of the larger bowel.

If it be found that the presenting coil is small intestine it must be replaced and another coil brought up with the finger

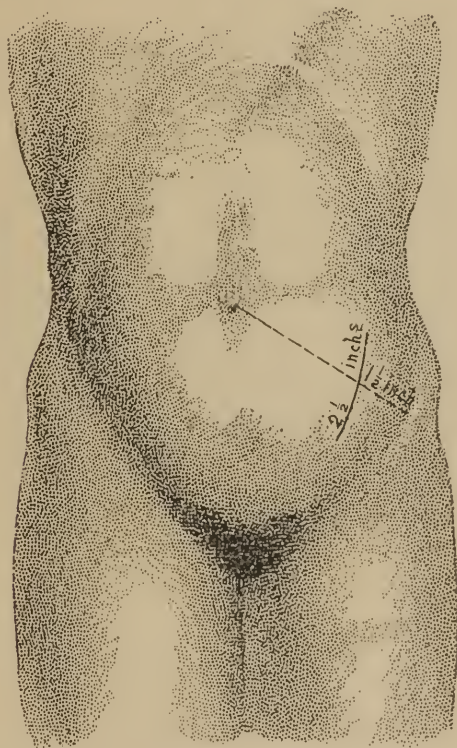


FIG. 11.—Incision in Inguinal Colotomy (Cripps).

from the brim of the pelvis. When the gut is much distended, difficulty may occur at this stage of the operation from protrusion, and the coil may require considerable pressure to keep it in the abdomen. No violence must be used, for a distended colon in a case of obstruction is often much thinned, and liable to rupture with slight violence. The protrusion can usually be easily managed by the pressure of a flat sponge or the closure of the wound with the fingers.

The selected coil is next to be drawn downward till it is held firmly by the mesentery above, and fastened to the edges of the wound in this position. In several of my later cases I have used a hare-lip pin, as the first step in fastening the gut, and I am much pleased with the results. The pin is passed under the coil at a point nearer the lower than the upper end of the wound in the following manner.

It is entered through the skin at the junction of the middle and lower third of the incision and half an inch from the edge, passed through the edge of the parietal peritoneum on that side, then through the mesentery close to the gut or through the muscular wall of the gut itself at a point corresponding to the attachment of the mesentery, then through the edge of the parietal peritoneum on the opposite side, and finally out through the skin on the side opposite its entrance.

By this simple manœuvre several important steps in the operation are accomplished at once. The gut is firmly secured in the required position so that it cannot be displaced by the patient should straining occur under the anæsthetic or after, and all the rest of the operation is rendered easy. Again, the sharpest possible spur is formed in the posterior wall of the gut, at the junction of the middle and lower thirds.

The gut is next stitched to the edge of the wound all around, each suture being made in the following manner (Fig. 12). A small, round, slightly curved needle is used, armed with fairly strong silk. The needle is passed through the skin an eighth of an inch from the edge of the incision, then through the cut edge of the parietal peritoneum at a corresponding point, then through the muscular wall of the gut. Care must be taken not to perforate the whole thickness of the intestinal wall so that feces may escape through the puncture, and yet sufficient of the wall must be included in the stitch to secure it firmly. When one of the longitudinal bands comes in the right place or can be brought there, it is well to pass the sutures of one side through this band for additional strength. The sutures should also pass well back toward the mesenteric border of the gut in order that at least two-thirds of the circumference may be outside of the wound when all of the sutures have been passed. Each suture may be tied and the ends cut off as it is passed.

Generally about a dozen sutures are sufficient to give close

approximation. If for any reason the gut is to be opened at once, this number may be increased by three or four for additional security. The wound is then dressed first with a piece of protective, then with a layer of wet bichloride gauze, then with absorbent cotton, and, finally, with a broad obstetrical bandage. The protective is important, for much lymph will be thrown out around the wound during the first day, and the gauze, if put next to the wound, will be found so closely matted down as only to be removed with great difficulty.

The dressing thus applied need not be disturbed till the

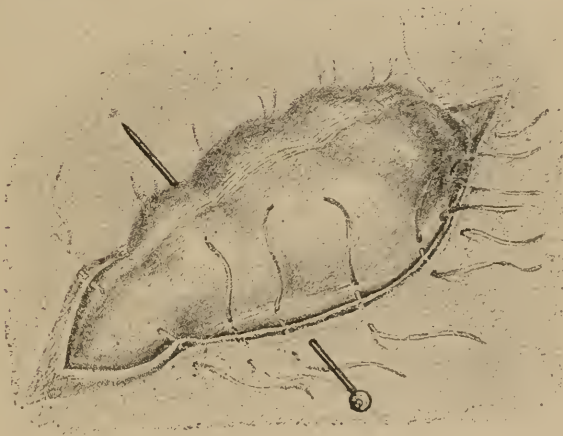


FIG. 12. (After Cripps.)

end of the third day. No opium need be given unless there be some special indication; and the patient should be fed upon milk.

At the end of the third day, and much sooner should the patient be suffering from obstruction, the operation may be completed. The provisional union of the two serous surfaces which shuts off the peritoneal cavity occurs in a few hours; and with the hare-lip pin to support the gut and hold it immovable, the gut may be opened without waiting for absolute union. The operation is completed by incising the gut longitudinally with a sharp bistoury, and paring down the edges with scissors to within a third of an inch of the skin border. No ether is necessary and no pain will be experienced. There is always a free oozing of blood for a few minutes, but it is

seldom necessary to tie anything. The pin should not be removed till three or four days later, and the sutures may be left to work their own way out.

From the nature of the operation as thus performed it is evident that when the convex surface of the loop of gut has been cut away, two openings into the lumen of the bowel will exist—a large one passing into the upper segment and a smaller one into the lower. Between these openings there is a sharp spur formed by the posterior border of the gut where it has been sharply bent over the pin. This arrangement has always in my experience been effectual in preventing any passage of fecal matter from the upper, larger opening, into the smaller, lower one—a thing which, when it occurs, detracts greatly from the advantages of the operation.

There is a great advantage in all cases in leaving the distal end of the gut open at both ends as is done in this operation, for by inserting a syringe into the wound the rectum may be thoroughly washed out as often as there is any accumulation of discharge.

In non-malignant disease it is well in the operation to preserve as much of the circumference of the gut intact as possible, in case it should in the future be thought advisable to close the artificial anus. The only difference in operating to secure this end is to include less of the circumference of the gut in the row of sutures—making the opening only large enough to give a free outlet.

In some cases after the operation an annoying prolapse of mucous membrane will occur from the upper segment.

This has never been an element of trouble in any of my cases, and I attribute the fact to the drawing down of the upper part of the coil firmly before attaching it to the skin.

After the operation the action of the bowel may be left to nature. Sometimes during the operation scybalous masses may be felt in the sigmoid flexure and these are an additional indication that the large bowel is under the finger. If possible I always prefer to have these masses above rather than below the point of gut to be opened, for their evacuation is then easy; and when in the distal portion they cause pain by their presence and may have to be washed down and out with the syringe. The first evacuation may occur immediately the bowel is opened or may be delayed several days or even a

week. In the latter cases there has probably been chronic dilatation and obstruction, and some time is required for the muscular wall to recover its tone.

With regard to the artificial anus, Cripps, I believe, has reported one case of sphincteric action, but it is safer not to promise so favorable a condition. In none of my cases have I seen anything that could properly be called voluntary control of the evacuations. This does not, however, imply that these patients are troubled with a constant involuntary evacuation of fæces, for such is not the case. I have one patient, indeed, who never has a movement more than once a week and only after a laxative. When the patient has diarrhœa there will be a constant discharge of fluid fæces till the diarrhœa is checked; but under ordinary conditions the bowel can be trained to move at a regular time each day; the patient is easily able to care for the evacuation, and is then comfortable for the balance of the day. Both men and women are able to attend to their duties and enjoy life.

In the way of a dressing a truss may be made similar to the ordinary one for inguinal hernia which will cause sufficient pressure to prevent the escape of solid fæces. Most of my cases, however, are more comfortable with a wide bandage around the waist, holding a piece of sheet lint upon the opening except when taking active exercise. The truss should only be worn during the day.

#### GENERAL TREATMENT.

In the treatment of non-malignant stricture and ulceration I have for some years back been using the tincture of arbor vitæ in large doses for the specific effect it seems in some cases to exercise upon diseased mucous membranes. Where there is much ulceration in connection with the stricture this may be continued for many weeks with occasional interruptions, and should be combined with local applications to the diseased surface. After division of the stricture, these agents should be used while the subsequent dilatation is being practised; and under their combined influence the discharge and pain will often either entirely cease or be greatly diminished.



In malignant disease I have also used *arbor vitæ* internally, but have seen no effect from it.

Much comfort may be given patients with stricture by a proper regulation of the diet. The pain of the disease is in great measure caused by defecation and the object should be to relieve the rectum of as much work as possible. This is best accomplished by a fluid diet of the most concentrated form. Milk, strong beef soups, and eggs give the greatest possible nourishment with the smallest residue, and on these the patients should live. In this way constipation is produced and this is best relieved by the use of the long tube every day or every alternate day. The injections must be carefully directed by the physician and should be administered through a good-sized soft catheter passed above the stricture. They should consist only of warm water or of olive oil. A gentle laxative such as the compound licorice powder may be also given at night if it be necessary. The injections should be large, as much fluid being thrown up as the patient can well bear, and when this is evacuated, as it will be at one sitting, the bowel above the stricture will be emptied and the patient free from discomfort.

Opium is a thing never to be denied these sufferers from malignant disease, but to be employed so as to obtain the greatest amount of good. Care must be taken not to cultivate an opium habit, for when once this is formed the craving for the drug will induce the patient to counterfeit pain; and before the end of the disease is reached all benefit to be derived from the anodyne is lost. If these patients are taught the use of the hypodermic syringe, it is very likely to be abused.

#### TABLE OF CASES.

Whole number.....	96
Males.....	51
Females.....	45
Cancer.....	44
Venereal.....	15
Non-venereal.....	25
Doubtful (non-malignant).....	6
Congenital.....	3
Due to pressure.....	2
Spasmodic.....	1



## TABLE OF OPERATIONS.

*Proctotomies.*

No.	Date.	Name.	Sex.	Age.	Remarks.	Result.
1	1878	H.	F.	26	Tight venereal stricture; internal incision without drainage followed by pelvic peritonitis. Patient in good condition four years later....	Recovery.
2	1880	F.	F.	30	Slight stricture; internal incision. Case lost sight of a month later....	Recovery.
3	1881	R.	F.	32	Non-venereal stricture and fistulæ; external operation. Patient greatly relieved and in good condition five years later.....	Recovery.
4	1881	P.	F.	21	Extensive stricture; external operation. No after-history.....	Recovery.
5	1881	Z.	F.	27	Tight and extensive stricture, probably venereal, external operation. Six months later no recontraction.	Recovery.
6	1882	B.	M.	40	Old venereal stricture; external operation. Good condition one year later.....	Recovery.
7	1882	P.	F.	38	Old venereal stricture; external operation. Recontraction from neglect of bougie six months later.....	Recovery.
8	1883	H.	F.	54	Extensive malignant stricture; external operation; severe secondary hemorrhage. Death eight months after operation.....	Recovery.
9	1885	P.	M.	50	Old syphilitic stricture; external operation. Result good as long as bougie was used.....	Recovery.
10	1886	D.	M.	30	Extensive malignant disease. Died on seventh day with symptoms of peritonitis and exhaustion.....	Death.
11	1888	L.	F.	34	Non-malignant stricture; internal operation with drainage. No symptoms two years and a half later, except tendency to contract when bougie has not been used for some months.....	Recovery.
12	1888	R.	M.	46	Non-malignant stricture and fistulæ; internal operation with drainage posteriorly, and complete division of stricture with sphincters through a fistulous track anteriorly.....	Recovery.

*Stricture of the Rectum.**Proctotomies.—(Continued.)*

No.	Date.	Name.	Sex.	Age	Remarks.	Result.
13	1888	A.	F.	34	Malignant stricture and intestinal obstruction; external operation. Death from shock in 8 hours . . . . .	Death.
14	1889	B.	M.	28	Stricture from hæmorrhoidal ulceration; internal operation with drainage. No recontraction one year later. . . . .	Recovery.
15	1889	P.	F.	35	Slight stricture; internal operation with drainage. No subsequent treatment. Case lost sight of after three weeks. . . . .	Recovery
16	1890	H.	M.	57	Very extensive non-malignant stricture of nearly 30 years' standing. Under ether the disease was found to extend too high for safe posterior division, and the upper portion was subsequently treated by dilatation. Four months after operation the patient was having one natural daily passage, was using No. 11 bougie without pain, and was more comfortable than for many years. . . . .	Recovery.
17	1890	N.	F.	25	Tight non-malignant stricture; internal incision and drainage. Now under treatment. . . . .	Recovery.

*Inguinal Colotomies.*

1	1888	McK	F.	50	Acute obstruction from pressure of cancerous mass opposite promontory of sacrum. Intestine much congested and abdomen full of fluid. Lived 18 months. . . . .	Recovery.
2	1888	C.	M.	58	Extensive non-malignant ulceration, stricture, and fistulæ. Great relief. Alive two years later. . . . .	Recovery.
3	1889	C.	M.	31	Intestino-vesical fistula and cancer of the rectum. Immediate relief of vesical symptoms. . . . .	Recovery.
4	1889	P.	M.	49	Extensive malignant disease. Immediate relief to worst symptoms. Alive one year later. . . . .	Recovery.
5	1889	M.	M.	80	Extensive cancerous obstruction and great exhaustion. Death 52 hours after operation of exhaustion, without shock. . . . .	Death.

*Inguinal Colotomies.*—(Continued.)

No.	Date.	Name.	Sex.	Age.	Remarks.	Result.
6	1889	S	M.	35	Cancerous stricture ; operation followed by sufficient relief to allow patient to get out of bed and into the street for exercise. Alive six months later. ....	Recovery.
7	1890	R.	F.	42	Rectum occluded by pressure of pelvic abscess, added to old stricture and ulceration. One month after operation patient had gained 20 pounds in weight, and was more comfortable than at any time since disease began. ....	Recovery.
8	1890	F.	F.	60	Tight cancerous stricture and chronic obstruction ; abdominal glands all involved ; 48 hours after operation patient suddenly taken with symptoms of collapse ending fatally in a few hours ; autopsy revealed an obstruction by a mass of cancerous mesentery at the splenic flexure of the colon which had occurred since the operation. ....	Death.

*Excisions.*

1	1884	M.	M.	55	Excision of cancerous mass on anterior wall of rectum three inches from anus, involving peritonitis. Death 52 hours after operation from exhaustion. ....	Death.
2	1887	W.	M.	64	Non-malignant stricture and large polypus filling rectum. Result good as regards recontraction and sphincteric control. ....	Recovery.
3	1887	F.	M.	69	Circumscribed cancerous growth on anterior wall opposite prostate. ....	Recovery.
4	1889	B.	F.	24	Extensive non-malignant stricture ; complete circular resection ; subsequent operation for incontinence successful. No recontraction. ....	Recovery.
5	1889	R.	F.	38	Complete circular resection for cancer ; vagina opened ; return of two nodules in recto-vaginal septum 6 months later. Second operation for these also successful. ....	Recovery.

*Stricture of the Rectum.**Excisions.—(Continued.)*

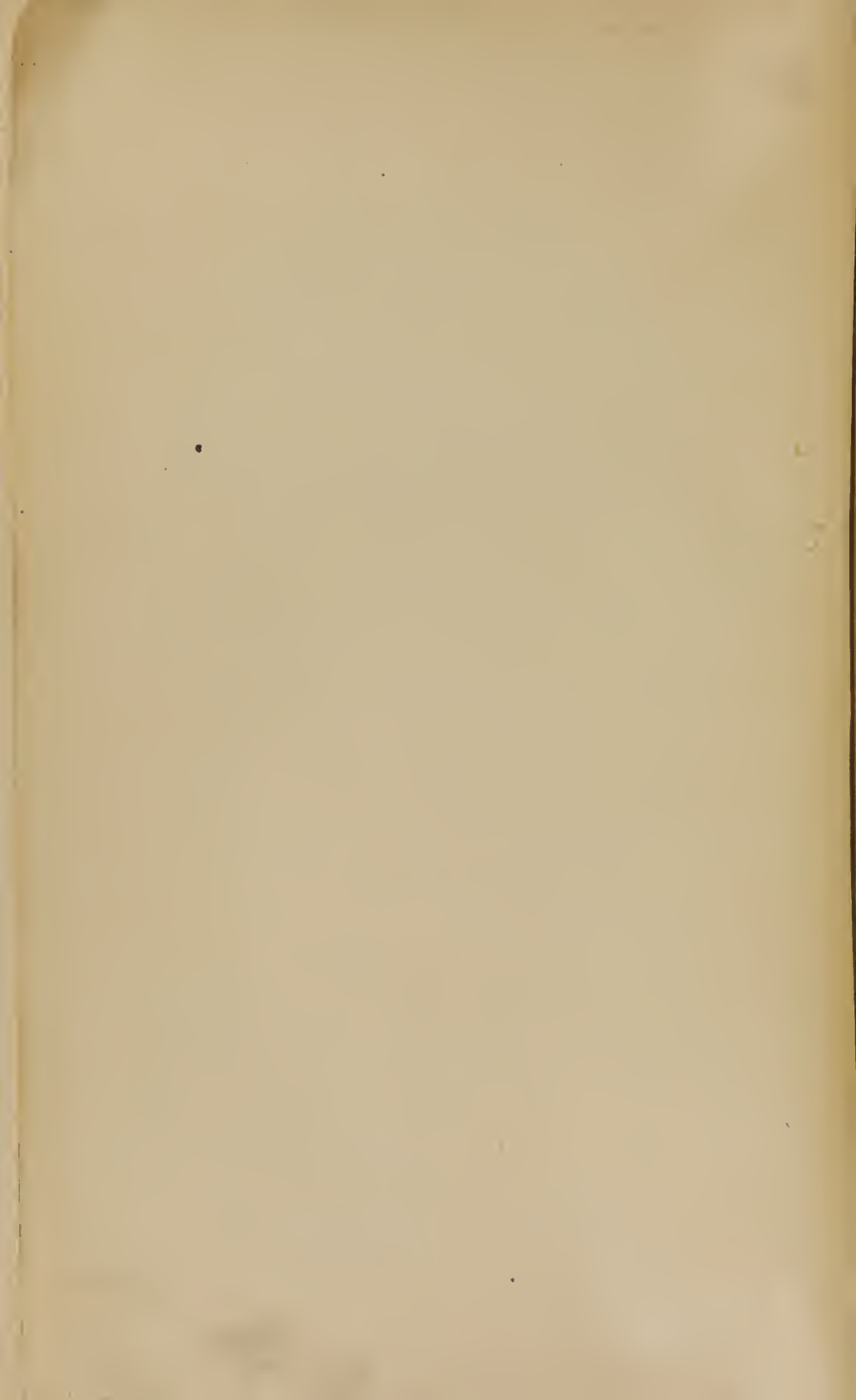
No.	Date.	Name.	Sex.	Age.	Remarks.	Result.
6	1890	R.	M.	58	Non-malignant stricture: complete circular resection. No recontraction, and but slight sphincteric control.....	Recovery.
7	1890	P.	M.	50	Cancerous stricture with chronic obstruction; complete circular excision; gut above the disease very much distended and ulcerated. Collapse from rupture of sigmoid flexure above the operation fatal in 12 hours.....	
						Death.













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